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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/780,632 | 02/09/2001 | Surinder M. Maini | HT-3765 US NA | 9350 |
| 23906 | 7590 | 01/21/2005 | | |
| E I DU PONT DE NEMOURS AND COMPANY LEGAL PATENT RECORDS CENTER BARLEY MILL PLAZA 25/1128 4417 LANCASTER PIKE WILMINGTON, DE 19805 | | | EXAMINER BOYD, JENNIFER A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1771 | |
| DATE MAILED: 01/21/2005 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/780,632

Applicant(s)

MAINI, SURINDER M.

Examiner

Jennifer A Boyd

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 8, 2004 has been entered. The Applicant's Amendments and Accompanying Remarks, filed November 8, 2004, have been entered and have been carefully considered. Claim 18 is amended and claims 10 – 18 are pending. In view of Applicant's amendment, the Examiner withdraws the objection of claim 17 as set forth in the previous Office Action dated May 4, 2004. The Examiner withdraws the previously set forth rejection as detailed in paragraph 4 of the previous Office Action dated May 4, 2004. The submitted Declaration has been considered but the Examiner disagrees with the Applicant's statements in the Declaration. The invention as currently claimed is not found to be patentable for reasons herein below.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

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3. Claims 10 – 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behnke et al. (US 4,120,914) in view of Barbeau et al. (US 5,299,602) and further in view of Kolmes et al. (US 6,349,531).

Behnke is directed to aromatic polyamide fiber blends for protective clothing such as protection for extreme temperature conditions such as that provided by exposure to burning fuel (Title and column 1, lines 15 – 30).

As to claims 10 and 16 - 18, Behnke teaches an intimate blend of aromatic polyamide staple fiber components comprising 45 – 55 weight percent poly(m-phenylene isophthalamide) fibers and 45 – 55 weight percent poly(p-phenylene terephthalamide) fibers (Abstract). The Examiner equates the poly(m-phenylene isophthalamide) fibers to Applicant's "meta-aramid" and the poly(p-phenylene terephthalamide) to Applicant's "para-aramid". It should be noted that yarns comprising 45 – 55 weight percent poly(m-phenylene isophthalamide) fibers and 45 – 55 weight percent poly(p-phenylene terephthalamide) fibers meet Applicant's weight percentage requirements of claim 18. Additionally, Behnke provides an example of a 50/50 blend (column 6, lines 50 – 55). Behnke teaches that the appropriate proportions of the aromatic polyamide staple components are blended and spun into yarns and woven into fabrics (column 6, lines 29 – 35).

As to claim 14, Behnke teaches that the woven fabric can have a plain weave construction (column 6, lines 55 – 65).

As to claim 15, Behnke teaches that the woven fabric can have a twill weave construction (column 6, lines 55 – 65).

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As to claim 10, Behnke fails to teach that the yarn is multi-filament yarn.

Barbeau is directed to a textile material for an outer shell of a firefighter's garment (Title). Barbeau teaches a woven fabric where the warp yarns are made of multi-filamentary aramid yarns while the wefts comprise alternate multifilamentary aramid yarns and spun aramid yarns (Abstract). Barbeau notes that typically outer shells in such applications are constructed of spun yarns. However, spun yarns do not slide easily on themselves or on surfaces inside or outside with which they come in contact. As a result, a certain amount of body energy is required to move in the garments or flex joints, and to otherwise perform functions associated with the job of the wearer. Additionally, the outer shell material must not fall below the minimum performance requirements. For example, a garment could be made lighter by employing a lighter weight outer shell fabric; the drop in weight would create lowered mechanical resistance. Barbeau teaches one method of overcoming the decrease in mechanical resistance as fabric weight decreases is to use filament instead of spun yarns. Barbeau notes filament yarns have a very high tensile strength and abrasion strength. Also, filament yarns are more slippery than spun yarns thereby reducing the friction between the filament fabric and any other fabric with which it may come in contact. This slipperiness increases the flexibility and mobility of the garment thereby reducing metabolic heat build-up (column 1, lines 15 – 45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the spun yarns form of Behnke with the filamentary yarns of Barbeau motivated by the desire to reduce fabric weight, increase mechanical resistance and increase flexibility and mobility of the woven fabric.

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As to claim 10, Behnke in view of Barbeau fails to teach that the yarn has a random entangled loop structure.

Kolmes is directed to composite yarns useful in the manufacture of various types of protective garments (column 1, lines 10 – 15). Kolmes notes that it is well-known in the art to create textured yarns using a variety of texturing processes. The term “texturing” refers generally to a process of crimping, imparting random loops or otherwise modifying continuous filament yarn to increase its cover, resilience, warmth, insulation and/or moisture absorption. Further, texturing may provide different surface texture to achieve decorative effects (column 1, lines 45 – 53). Kolmes further teaches that one well-known texturing method is air-jet method in which the yarn structure is open by the air-jet, loops are formed therein, and the structure is closed again on exiting the jet (column 1, lines 55 – 60). Furthermore, Kolmes notes that the use of an air jet device to air interlace two materials together produces a composite yarn having surprising softness, hand and tactile response (column 2, lines 20 – 30). Kolmes further notes that the glove constructed as shown in Figure 5 incorporating the interlaced yarn is found to be more flexible and provide better tactile response to the wearer while providing similar levels of cut resistance performance.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to create the yarn of Behnke in view of Barbeau with a random loop structure as suggested by Kolmes motivated by the desire to increase the cover, tactile properties and flexibility of the yarn and resulting fabric making it highly suitable for protective garments.

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As to claims 10 – 11, although Behnke in view of Barbeau and Kolmes does not explicitly teach the claimed yarn having random entangled loop structure wherein the weight per length of the yarn is 3 – 25% higher as required by claim 10 or 10 – 18% higher as required by claim 11 than continuous filament yarn having the same composition but no entanglement or loops, it is reasonable to presume that the yarn with a random entangled loop structure would inherently have a weight per length that is 3 - 25% higher as required by claim 10 or 10 – 18% higher as required by claim 11 compared to a continuous filament yarn having the same composition but no entanglements or loops. Support for said presumption is found in the use of like materials (i.e. a yarn of a co-mingled bundle of para-aramid and meta-aramid filaments having a random entangled loop structure) which would result in the claimed property. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed property would obviously have been present once the Behnke in view of Barbeau and Kolmes product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977).

As to claims 12 - 13, Behnke in view of Barbeau and Kolmes discloses the claimed invention except for the yarn has a linear density of 200 to 1000 denier as required by claim 12 and the yarn has a linear density of 300 to 600 denier as required by claim 13. It should be noted that the linear density of the yarn is a result effective variable. As the linear density increases, the fabric becomes stronger and less flexible. It would have been obvious to one having ordinary skill in the art at the time the invention was made to create a yarn with a linear density of 200 to 1000 denier as required by claim 12 and the yarn has a linear density of 300 to 600 denier as required by claim 13 since it has been held that discovering an optimum value of a result

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effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present invention, one would have been motivated to optimize the linear density of the yarn in order to create a light-weight, strong and properly heat resistant fabric.

Response to Arguments

4. Applicant's arguments with respect to the rejection of November have been considered but are moot in view of the new ground(s) of rejection.

In regards to the Declaration, the Examiner has given full consideration to the Declaration but submits that the Declaration is not commensurate in scope with the claims. Independent claim 10 nor any of the dependent claims require that the woven fabric of the instant invention has improved resistance to elevated temperatures. The Applicant only claims a "woven fabric". Also, the Applicant submits that "one of ordinary skill in the art would expect a firefighting garment made using the inventive fabric would weight more, and therefore would be less desirable". The Examiner agrees that in the field of firefighting garments it is desirable to minimize the weight of the material and the inventive fabric comprising random entangled loop structure yarn would weigh more than the fabric without the entanglements or loops. However, the Applicant has seemed to imply that their fabric would weigh less than a comparative fabric. It appears that the inventive fabric weighs less only because the Applicant has altered the filament size. It is known in the art that if one creates a fabric with smaller diameter filament yarns, the fabric would weigh less than a fabric with large diameter filament yarns keeping all other parameters the same. It should be noted that the Applicant does not claim thinner diameter

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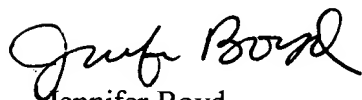
filaments in independent claim 10 or any of the dependent claims. The Applicant has claimed a linear density in claims 12 – 13 but has not indicated that the diameter of the filaments are smaller than what is typically used. Based on those facts, it is unclear how the novelty of the invention is achieved and furthermore how it is represented in the claims. It is highly suggested by the Examiner to amend the claim language to indicate the relationship of the use of randomly entangled loop structure yarns and finer diameter filaments to create a fabric that has improved heat resistance and lower weight. Also, it should be noted that the Examiner believes that the weight per unit length of a random entangled loop yarn would inherently be 3 – 25 % higher than a continuous filament yarn having the same composition but no entanglements or loops because all physical limitations have been met (a yarn having a random entangled loop structure comprising a co-mingled bundle of 10 – 90% para-aramid filaments and 90 – 10% meta-aramid filaments). If said property is not inherent, it is asserted that Applicant's claim must be incomplete. In other words, if Applicant's asserts a lack of inherency in the Behnke in view of Barbeau and Kolmes product, then Applicant's claimed invention is missing an element that is critical to the invention, which would patentably distinguish it from the known prior art.

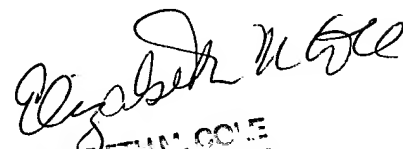
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A Boyd whose telephone number is 571-272-1473. The examiner can normally be reached on Monday thru Friday (8:30am - 6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jennifer Boyd
January 14, 2005


ELIZABETH M. COLE
PRIMARY EXAMINER